

THE IDENTITY OF INDISCERNIBLES

KANT thought that he had a knockdown refutation of Leibniz's principle of the Identity of Indiscernibles. He said that, since there can be two indistinguishable but distinct drops of water, the Identity of Indiscernibles (I/I, hereafter) is false. This paper argues that all such spatiotemporal examples are inconclusive. Even if we consider only objects which, unlike monads, occur in space and time, there is no possible universe that *must* be described in a manner incompatible with I/I. Yet this fact is no proof of I/I, for some imagined universes *may* be described in a way that violates the principle. In short, it is vain to contemplate possible spatiotemporal worlds to refute or establish the identity of indiscernibles.

I do not contend that nothing can settle the truth of I/I, but only that possible worlds are never sufficient. Kant, then, was wrong when he said in the Amphiboly of Concepts of Reflection that "in the case of two drops of water we can abstract altogether from all internal difference (of quality and quantity), and the mere fact that they have been intuited simultaneously in different spatial positions is sufficient justification for holding them to be numerically different" (A263/B319). Most readers, like P. F. Strawson in his chapter on "Monads" in *Individuals*,¹ think that Kant is right, although Strawson grants that symmetric spatial universes have little force against Leibnizian monads, because monads are not spatial. Of notable philosophers, perhaps Russell was the most obdurate, insisting against Wittgenstein in *An Inquiry into Meaning and Truth*² that I/I is analytic—a far stronger claim than Leibniz ever advanced. Conversely, Wittgenstein in *Tractatus* 5.5302 implies that a symmetry argument refutes Russell's definition of number and of identity. The pursuit of such logical questions might settle the issue of I/I, but mere reflection on spatiotemporal examples is never enough.

The inadequacy of examples for settling I/I illustrates a general fact about the philosophy of space and time. The examples are "underdetermined." Newton's celebrated rotating bucket must be the oldest instance. In *Principia*,³ we are to imagine a universe with nothing in it but a bucket of water that starts to spin. This hypothesis can make no sense to a relativist, yet we know what would

¹ New York: Doubleday, 1963.

² Baltimore: Penguin, 1972; p. 97.

³ 3rd edition, London, 1726, pp. 10/11. See the *Scholium* to the definitions in any translation.

happen if it were true. Although the "spin" would not be visible, the water would gradually start to rise up the side of the bucket. Hence, even if there were nothing else in the world, there would be a difference between spin and rest, and so, said Newton, relativism is refuted. It seems to have been left to Mach, chapter 2, section 6, of the *Science of Mechanics*, to protest that such an interpretation depends on imposing laws from our universe on to this "abstraction." Alternative laws can explain the changing meniscus in an emptied universe.

For a more recent example, take Sydney Shoemaker's engaging proof that eventless time is possible.⁴ His pretty argument takes three shut-off worlds that can observe each other. A and B see C freeze solid, with no change, every k years; A and C see B do it every m years; B and C see A do it every n years. No factors are common to k , m , and n . These propositions are regarded as well corroborated, except that every kmn years no freeze is observed. The simplest explanation is that the whole universe has frozen, and nothing happened while a year elapsed. As Shoemaker acknowledges, this conclusion is not entirely forced upon us, for by adopting more "complex" laws of nature we could still maintain that eventless time is an absurdity.

As a final example I may refer the reader to a construction of my own, set forth in my article, "A Leibnizian Space,"⁵ in which it is shown how to make a phenomenal world of space and time out of a purely monadic description of a universe. The monadic description determines a set of pairs of spaces and laws. The actual space for a given set of monads is (according to my account of Leibnizian metaphysics) that space which has the simplest laws. It is shown how in some tiny worlds there is a unique space with simplest laws. Although such fabricated worlds are skimpy compared to ours, they are still not only infinite but also continuous.

A general moral to draw from examples like these has already been indicated by the history of physics in this century. There can be no determination of spatial relations without a study of the laws of nature attributed to objects in space. When such laws are prescribed, most of space falls into place. Different generations of philosophers learn the moral in different ways. Russell's book on Leibniz seems to have picked it up from Lotze. I got it from lectures of Jonathan Bennett.

⁴ "Time without Change," this JOURNAL, LXVI, 12 (June 19, 1969): 363-381.

⁵ *Dialogue*, XIV, 1 (March 1975).

In arguing that in a certain possible world there exist two distinct but indistinguishable objects, bland assertion that there are two such objects is not enough. There must be argument. Kant's argument is that, by abstraction from our world, in which there are two drops of water on the pane of my window, we obtain just two such objects, and nothing else. The question remains whether the result of this feat of abstraction is correctly described as having two indiscernibles in it. Simply to say so is to beg the question. To say, "look and see," is worthless, for there is nothing answering Kant's description to look at. When I look I see a pane, some drops, a yew tree behind, and some people waiting for a bus. It is no use to declare, "I can see in my mind's eye"; for seeing in your mind's eye is not looking. (Compare Wittgenstein's remark on the *Foundations of Mathematics*: "But suppose someone were to say: 'I am now imagining a curved line,' whereupon we tell him: 'So you see the line is a curved one'—what kind of sense would that make?"⁶) No matter how vivid your imagination, it remains a question how correctly to describe the content of your imagination. So how does the description go?

On hearing of Kant's two droplets, *L* (an interlocutor who plays the part of Leibniz) can reply that the correct description of what one gets by abstraction is a world with one drop of water in it. List all the true propositions, expressed in purely general terms, that occur in *K*'s description, omitting the question-begging "There are two drops." Every one of these propositions, asserts *L*, occurs in the description of my one-drop universe, which is, therefore, a complete description of what there is.

L seems wrong. *K* retorts that at least one proposition has been omitted: "Every drop is ten diameters from a drop." This proposition is true in *K*'s description, false in *L*'s. So the one-drop universe does, after all, differ from a two-drop world.

If Newtonian absolute space is deemed to exist, then *K*'s riposte settles the matter. But Leibniz's chief polemical use of I/I was in the correspondence with Clarke, where he used it as a nutcracker to crush absolute space. On his relativistic view, spatial relations are relations between objects and are determined by the objects. The totality of spatial relations is defined, in part, by the totality of objects. We cannot argue that there must be two objects from the premise that the relation "being ten diameters from" is instantiated in *K*'s world. To avoid question-begging we must first show

⁶ *Remarks on the Foundations of Mathematics* (Cambridge, Mass.: MIT Press, 1967), part I, sec. 98.

that there are two drops, or first show, on independent grounds, that absolute space exists.

Nowadays few people would stick their heels in and insist on absolute space-time to make *K*'s point, for that would also imply that a two-drop universe whose drops move 10 yards along the "natural" axis differs from a universe in which they are still. One should not commit oneself to such non-differences to show that a two-drop universe differs from a one-drop universe.

K may try to avoid the prior commitment to absolute space by contemplating an observer at a point. This disembodied watcher sees a two-drop world that looks different from a world with only one extended object in it. *L*'s reply is flippant: this is a description of a world occupied by one water drop and a soul that sees double.

At this juncture *K* may wryly employ a Leibnizian simile to enforce his claim. Let us suppose that each drop reflects the other, not in the way that monads reflect each other, but in the way that a still pool of water reflects the sky. The "sky" of each drop is populated by one drop of water. Thus the proposition "Every drop reflects a drop on its surface" is true only in the two-drop world. If so, *L*'s one-drop description of *K*'s abstraction is incomplete.

L replies by continuing the Leibnizian simile. Every drop reflects itself. On the surface of every drop there is a smaller but exact projective representation of itself. *L* notes that, even if we had to grant that there were two drops, this law of perception would fit *K*'s alleged facts just as well as *K*'s own. All that is unequivocally true in *K*'s abstraction, is exhaustively described in terms of one self-reflecting drop.

If *K* were to enrich his universe by filling it with radiation, nineteenth-century aether, and the laws of optics conjectured a hundred years ago, he would temporarily bolster his position, for the image on the surface of one drop could be produced only by irradiation from the other. Gulping as he feels himself sucked into quicksand, *L* insists that laws of nature do not exist in a void. They exist as descriptions of what happens or what would happen, and one cannot just say that those old-fashioned laws of propagation are what hold in *K*'s world.

To make it more plausible that the laws of optics apply to his imagined world, *K* might suggest that our world history went on until 1860, when everything went out of existence, except that two drops of water occupy the void. The laws of nature before and after 1860 must, urges *K*, be deemed the same, and so there must be two drops, each reflecting the other. Evidently *L* will retort that there

is no reason to maintain that the laws of 1859 obtain after the cataclysm. Certainly the droplets that are left cannot be related to anything that existed earlier. If they were related to, say, the eggs that Clerk-Maxwell had for breakfast just before the end, then they would be distinguished by the different relations that they bear to those eggs, and we should have no counterexample to I/I. But if the drops bear *no* relation to what existed before 1860, there is no reason to ascribe to them the laws of nature that are found convenient for the pre-1860 world. The absolutely new drop(s) can have no historical or physical connection with anything prior, so there is no compulsion to use pre-1860 laws of nature.

K may abandon drops and try for more complicated worlds that are better suited to his point. Strawson presents a lonely chessboard, whose squares are thought of as "perceiving" the other squares. This world looks the same from QB3 as from KB5. There is nothing to distinguish the two squares. In this symmetric universe we have different individuals (squares) with all the same general properties. Dulled by repetition, *L* once again asks, why *that* description?

After we have abstracted everything from the universe except a uniform chessboard, why say we have a complete chessboard equipped with perceptive squares? One could equally well describe what exists as half a chessboard perceiving as if a mirror were set up on the diagonal. Or, indeed, since that still leaves us with some symmetries, we shall want a quarter board, the triangle cut from any one of the bases, with the center as its apex. There are four such triangles, all filled by self-observant squares and triangles, and the four (two pairs of incongruous counterparts) are internally indistinguishable. It seems entirely a matter of taste whether one chooses to describe the world as a whole chessboard with one set of laws of perception or as a quarter chessboard with another set of laws. That is, there is nothing true in one description and false in the other, except question-begging statements about the number of squares. There is no clear way to decide which of the two worlds has the simplest laws of perception. I incline to Strawson's, but there is nothing much in it. Note that one ought not prefer Strawson's board because it is richer. Richness, as Leibniz taught, comes from a variety of phenomena, not from iteration of the same thing.

Mention of incongruous counterparts suggest another standard move for *K*. Is not a world with two matching gloves different from a world with only a left-hand glove? Even if, in the one-glove world, it makes no sense to say whether the glove is left or right, at least

we may say, of the two-glove world. "For every glove there exists a glove that is its incongruous counterpart." But this is as question-begging as "Every drop is ten diameters from another drop." A single glove, all alone in the world, is neither left- nor right-handed. It is "handed" only with respect to a set of spatial relations, and we cannot glibly assert that there are two gloves in order to prove that those relations exist.

With ingenuity one can construct cases in which *L* is forced to adopt more complex descriptions of phenomena than *K*. For example, suppose that our drops are moving toward each other, touch, form a figure eight, and finally merge into one big drop. That is what *K* says is the case. Can *L* redescribe the universe, including every truth in *K*'s story, but omitting question-begging assertions about space or the number of drops? Before the collision and after the coalition he has no trouble. If we had only before-and-after pictures, there would appear to be just one static drop. But there is the intervening figure eight to explain. Leibniz must describe a world in which there is one drop that undergoes an instantaneous meiosis. The resulting eight then assumes the shape of a circle. Doubtless the story of "collision" sounds simpler to us than one of "meiosis," but that is because of our greater familiarity with collisions. There is nothing internal to *K*'s world to force our physics on it.

Increasing complexity can help *K*. Let the drops be not water but green paint. Cover them with a film of red. *K* can tell a colorful story about the collision. For verisimilitude he will employ the fluid dynamics of our world to determine the equilibrium end-point of this interaction. Can *L* reconstruct that? Of course he can, although his fluid dynamics will look strange. It is not thereby less simple, nor does it have less right to be used in a law-like description. Those who wish to pique *L* can ask him a question that would embarrass Leibniz. *K* can explain why the collision occurred just then. Two bodies, he says, finally ran into each other. But why, we ask of *L*, did meiosis occur just *then*?

This question suggests that time rather than space might give us a refutation of I/I. A. J. Ayer, writing on this topic in *Philosophical Essays*, suggests "an infinite series of sounds . . . A B C D A B C D A . . . , succeeding one another at equal intervals, with no first or last term."⁷ *L*'s reply is to query whether this Ayerial world has anything except the sounds A, B, C, and D, each occurring just once. We know that, if there is absolute space-time serving as a

⁷ New York: St. Martin's, 1963, p. 34.

receptacle for objects or sounds, then I/I is false. Kant's original water drops suffice for that. But if time is defined in terms of relations between objects, then we cannot use the temporal position of the objects or sounds to show that, for example, there are two (or infinitely many) occurrences of A.

K will protest that, in Ayer's universe, there is no first sound, whereas, if there are only four sounds, A, B, C, D, each occurring only once, then at least one of them must be a first sound. So Ayer's world is not correctly redescribed by L. L's reply may be interesting. There is not enough structure in Ayer's universe to guarantee a linear order to time. So imagine that these sounds have memories imposing an order of temporal precedence on sounds. L unrepentantly says that there are four sounds, each occurring just once. The time structure of the universe is circular, with D preceding A, which precedes B, which precedes C, which precedes the very same D that precedes A.

Russell, and Ayer following him, made I/I analytic, as a consequence of the very definition of "identity." That was not Leibniz's intention. He never maintained that I/I was a necessary truth, provable in a finite number of steps. On the contrary, he presents it as a consequence of the Principle of Sufficient Reason. There has been some confusion on this point. G. H. R. Parkinson in his book *Logic and Reality in Leibniz's Metaphysics*⁷ seems to contend that Leibniz *ought* to have regarded I/I as logically necessary because, according to Leibniz, no possible world confutes it. Perhaps Parkinson conflates 'in' and 'about'. Like the Principle of Sufficient Reason, I/I is not true *in* each possible world. It is true *about* all possible worlds. It is a metaprinciple about possible descriptions. This is part of the force of saying that it is a metaphysical principle.

What does this force amount to today? In his chapter "Monads," Strawson says that I/I must be a theological principle to the effect that a good god would not want to create a world in which it is false. I/I is stronger than that. It does have theological implications in the philosophy of Leibniz, but it is not a theological doctrine. *Tractatus* 3.031 reminds us: "It used to be said that God could create anything except what would be contrary to the laws of logic. The reason being that we could not *say* what an 'illogical' world would look like." Leibniz replaces 'could not say' by 'would not say'. That is, Leibniz *could not* describe a world in which a law of logic was false and *would not* describe any world in such a way that it contravenes I/I. Whatever God might create, we are

⁷ New York: Oxford, 1965.

clever enough to describe it in such a way that the identity of indiscernibles is preserved. This is a fact not about God but about description, space, time, and the laws that we ascribe to nature.

IAN HACKING

Center for Advanced Study in the Behavioral Sciences
Stanford

COMMENTS AND CRITICISM

COMMUNICATION WITHOUT SENSORY OVERLAP

Neal Grossman* has recently raised these questions: (1) Could there exist a being who had *no* sensory overlap with ourselves, including the sense of touch? (2) If so, could we communicate with such a being? (3) If so, how? Unlike many questions raised in philosophical journals, these questions have straightforward answers.

It is unlikely that the notion of sensory overlap will turn out to be unproblematic, but certain features of the notion are sufficiently clear to enable one to answer Grossman's questions. A being who was completely without sensory input channels would certainly be a being of the kind described in the first question. An example of such a being, it could be argued, is a human being in a sensory deprivation chamber. The requirement of communication complicates matters. To be a party to communication, surely a being must have at least one channel of sensory input, and some minimal ability to manipulate its environment. Sensory overlap is not required for communication to be possible in principle.

With an example which is a modification of Grossman's Martian one can answer all three questions: Having evolved in an environment of dense high-energy radiation, the nonetheless highly intelligent X-being has developed a kind of lead carapace, and the shielding thus afforded is so nearly total that, with the sole exception of a retina sensitive to that band of the electromagnetic spectrum we call "X-rays," the X-being is devoid of sensory input channels. There is, then, no sensory overlap between any human and any X-being. Nevertheless, it is clear that we can communicate with the X-being, by X-ray telegraphy, or, were we to find ourselves in the X-being's natural habitat, by simply gesturing, for the X-being

* "Empiricism and the Possibility of Encountering Intelligent Beings with Different Sense-structures," this JOURNAL, LXI, 22 (Dec. 19, 1974): 815-821, p. 821.